

Keynotes

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AOML Premieres Updated Web Site

AOML's premiered its updated and restructured World-Wide Web Internet site (www.aoml.noaa.gov) on July 20, 2001. The restructuring of the web site was motivated by the necessity of complying with NOAA's 508 Accessibility Compliance regulations, enabling persons with visual and audible limitations to successfully access AOML's web page.



Alejandra Lorenzo, a computer specialist with the Computer Networks and Services Division, spearheaded the effort, drawing upon the expertise and skills of AOML's scientific and technical support staff. The AOML-wide collaboration was further augmented by the active participation of several student interns, notably Michael Ha, Robert William, and Lenworth Wilcock. Monika Gurnee, web master for the Ocean Chemistry Division, is credited with having developed the overall design and structure of the new site.

In addition to the new site adhering to NOAA's compliance regulations, it now also features information regarding the three major scientific themes of AOML's research: oceans and climate, coastal and regional waterways, and hurricanes. Hypertext links for the three scientific themes enables viewers to learn more about AOML's current and long-term activities. Another new feature of the site includes a searchable index of the AOML publications database created by Joaquin Triñanes.

Era of Active Hurricanes to Continue

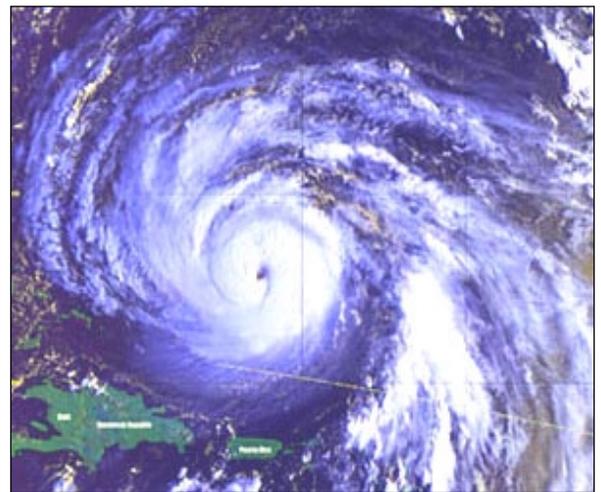
Scientists say hurricane seasons in the next two or three decades may be much more active than they were in the 1970s through early 1990s. And, they think they know why. Stanley Goldenberg, a research meteorologist at AOML's Hurricane Research Division, conducted research that shows warmer sea surface temperatures in the North Atlantic combined with a decrease in vertical wind shear contributes to conditions for more hurricanes over a several-year period. "When we see this combination, we better be prepared for a very busy period for hurricane activity," Goldenberg said. Goldenberg's findings appeared in the July issue of the journal *Science* (Goldenberg, S.B., C.W. Landsea, A.M. Mestas-Nuñez, and W.M. Gray. The recent increase in Atlantic hurricane activity. Causes and implications. *Science*, 293:474-479, 2001).

"From 1995-2000 we saw the highest level of North Atlantic hurricane activity ever measured," Goldenberg said. Compared with the previous 24 years, there were twice as many hurricanes in the Atlantic, including two and a half times more major hurricanes (those reaching category 3 strength with winds reaching more than 110 mph), and more than five times as many hurricanes impacting the Caribbean islands. We started looking at the records to find out why."

Goldenberg and co-authors Christopher Landsea, a research meteorologist also with AOML's Hurricane Research Division, Alberto Mestas-Nuñez, a physical oceanographer with NOAA's Cooperative Institute for Marine and Atmospheric Studies (CIMAS) at the University of Miami, and William Gray, professor of atmospheric science at Colorado State University, also tried to determine if the recent increase reflects a long-term climate shift.

"Looking at the changes in oceanic and atmospheric conditions, we think this shift is due to a natural ocean cycle called the Atlantic Multidecadal Mode, a North Atlantic and Caribbean sea surface temperature shift between warm and cool phases that lasts 25 to 40 years each," said Mestas-Nuñez. The data suggest that we are in the beginning of a warm Atlantic phase and thus an active Atlantic hurricane era may be under way, similar to that last seen from the late 1920s to the late 1960s."

The study finds that the record amount of hurricane activity could possibly be caused by a combination of the multidecadal scale of ocean temperature (*continued on page 2*)



HRD Employees Help Survey Atmospheric Scientists

A paper published in the July issue of the *Bulletin of the American Meteorological Society*, written by Mishelle Michaels of The Weather Channel and coauthored by Sim Aberson and Howard Friedman (of AOML's Hurricane Research Division), and others, provides the results of the most recent survey of AMS members concerning workplace issues. The AMS surveyed its membership in 1999 to update demographic information and to gain a more detailed perspective on workplace issues. This data collection and subsequent demographic analysis represents the first attempt to update information regarding the membership since the 1993 survey. The survey was designed to logically follow and expand upon the historical data of the membership collected at varying intervals since 1975.

The 1999 survey was broken into six parts. The sections on demographics, education, and current employment closely followed the previous surveys from 1993 and 1990 to facilitate direct comparisons. Members were asked how their age, gender, race, ethnicity, sexual orientation, education level, and disabilities have impacted their careers in the atmospheric and related sciences. Other parts of the paper discuss personal and workplace circumstances and additional issues concerning career choice and AMS membership, respectively. An additional space was provided for narrative comments regarding opportunities for women and minorities in the AMS-related sciences. Some 10,000 members were sent the survey questionnaire, and a total of 4,669 members responded. The paper (Michaels, M., M. Shepard, S. Aberson, H. Friedman, and K. Murphy. Survey results of society membership: The face of our profession at the threshold of the new millennium, *BAMS*, 82(7):1331-1532, 2001) can be obtained from the AMS Internet site (www.ametsoc.org/AMS/). Reprints can also be obtained from either Sim Aberson or Howard Friedman.



The 2001 AOML Hurricane Preparedness and Recovery Plan can be viewed in PDF format on the AOML Intranet at <http://queue/>

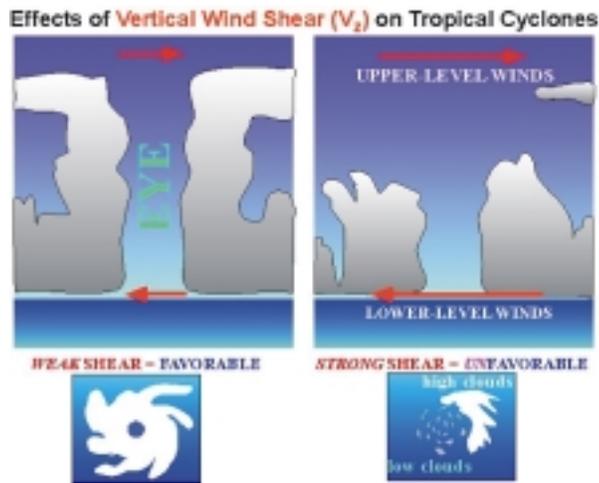
(continued from page 1)

changes plus a small contribution from the long-term warming trend. However, deficiencies in the data record make this a difficult issue to resolve.

NOAA has predicted normal levels of hurricane activity for the 2001 season. Goldenberg noted that while anticipating generally high activity during the hurricane seasons for the next few decades, not every year is expected to be hyperactive. Nonetheless, rapidly increased population and development means that hurricane damage will be far more than ever experienced by coastal residents. "Even weak storms can cause devastating floods," Goldenberg said.

The scientists note that an active hurricane season does not necessarily mean more storms making landfall, and caution that even years with a low level of activity can produce disasters. In 1992, Hurricane Andrew's landfall in south Florida became the costliest disaster in U.S. history and was the only hurricane to make landfall that year.

The North Atlantic hurricane season officially lasts from June 1 to November 30. Tropical storms that can turn into hurricanes and threaten the East and Gulf coasts of the United States may form in the Gulf of Mexico, Caribbean Sea, and Atlantic, many developing from easterly waves moving off the west coast of Africa. Hurricanes are fueled by warm water as they travel across the ocean. An abundance of warm water provides more energy, allowing the storms to increase in strength. The researchers, however, found that the warm water alone was not enough. Winds between the upper and lower troposphere (the first seven miles of our atmosphere starting from the ground or ocean and going upwards) also play a major role in development (see above graphic). Strong vertical shear in the wind inhibits the formation or intensification of tropical cyclones, whereas weak wind shear encourages them.



Official NOAA Press Release, contact Jana Goldman (301-713-2483 or Jana.Goldman@noaa.gov)

Summer Interns Report for Work

AOML hosted a luncheon party on July 13, 2001 to welcome and become better acquainted with its college and high school student summer interns. To help acclimate the interns to working at a federal environmental research facility, Director Kristina Katsaros presented a brief overview of the Laboratory's organization and how AOML fits within NOAA and the Department of Commerce hierarchy. Summer interns will perform an assortment of tasks in support of AOML's three science Divisions, as well as its administrative, computer services, and library operations. In addition to valuable work experience gained through their summer employment with AOML, interns will have the opportunity to enhance computer and mathematical skills, receive specialized training, and, in some instances, learn research methods and techniques.



AOML Director Kristina Katsaros shakes hands with Angel Flores, a University of Texas junior working as a summer intern for Dr. Tom Carsey of the Ocean Chemistry Division.

Congratulations

Jason Dunion, meteorologist with the Hurricane Research Division, was elected President of the Greater Miami chapter of the American Meteorological Society in June 2001.

Nirva Morisseau-Leroy, Oracle Database Administrator and Applications Developer for the Hurricane Research Division, has published her third book about the SQLJ programming language, *Oracle 9i SQLJ Programming* (ISBN 0072190930). The 687-page book is published by McGraw-Hill.

Shirley Murillo, meteorologist with the Hurricane Research Division, was invited by the Maritime Academy of Science and Technology (MAST) High School this past June to deliver the commencement speech for the 2001 graduating class of seniors. Shirley was a member of the MAST Academy's first graduating class in 1994.



Welcome Aboard

Elizabeth Forteza joined the staff of the Physical Oceanography Division in July as a member of the U.S. Argo Real-Time Data Processing Group. Her work will consist of monitoring the automatic real-time data processing stream for the Argo floats. Previously, Elizabeth worked as an oceanographer for the Cuban Institute of Hydrography and the Oceanographic Data Center in Havana, Cuba.



“Drifter” Project Helps Students Study Ocean Currents

Erica Van Coverden, Office of the Director

What do the following items have in common: wine bottles, mayonnaise jars, water bottles, oregano dispensers, and a ketchup bottle? They are all examples of containers chosen to act as ocean drifting buoys for a class science experiment. Thanks to the interest of Mr. Scott Barham, a Florida science teacher, his students will be learning a bit more about ocean surface currents and the challenges of experimental design. Mr. Barham, a middle school teacher at Oakridge Middle School in Collier County, Florida, formulated the class project while thinking of a new way to engage his students' interest in the oceans. His classes had been studying the Gulf Stream and were interested in learning more.

So how did AOML become involved in this endeavor? Mr. Barham searched the web for information on designing a drifter project. He contacted Ryan Smith, an oceanographer with AOML's Physical Oceanography Division, and asked for some tips on appropriate containers. Smith had recently worked with other AOML scientists in the design of a shallow water drifting buoy and gladly answered Mr. Barham's questions. Smith offered advice on bottle design (plastic versus glass), suggestions on ballast (if needed), and a list of information that should be included for the person who recovers a bottle in the future, such as the nature of the project and where and when the bottles were deployed.

Smith then went a step further and offered to deploy the classes' bottles on an upcoming research trip across the Gulf Stream. In total, 51 drift bottles were successfully deployed on May 25, 2001 at 0400 GMT from the R/V *Walton Smith*, a University of Miami research vessel. The deployment location was 27°N latitude, 79.37°W longitude, about 25 miles off the coast of Delray Beach, Florida. While the students who deployed the bottles are off for the summer and then on to high school, Mr. Barham hopes his future students will benefit from the anticipated response from those who recover the bottles.



A wide array of bottle types were collected by Collier County, Florida, middle school science students as part of a school project to study ocean currents.



Douglas Wilson, an oceanographer with AOML's Physical Oceanography Division, prepares to deploy a drifting bottle from the R/V *Walton Smith*.

Farewell

Kitack Lee, a CIMAS Research Associate with the Ocean Chemistry Division, resigned from AOML on July 11, 2001 to accept a faculty position at the Pohang University of Science and Technology in Korea. Dr. Lee will establish a chemical oceanography program within the University's Engineering School. Dr. Lee joined the Ocean Chemistry Division in 1997 and was a key member of the CO₂ group. During his tenure at AOML, he led several cruises in the Atlantic Ocean and Florida shelf. He also published extensively on topics including vertical diffusion estimates into the mixed layer and their effect on nutrient supply and global estimates of interannual variability of CO₂ sequestration by the ocean.



Travel

Jules Craynock, Joseph Bishop, Jack Stamates, and Charles Featherstone participated in a Wastewater Outfall Study in Boston's Massachusetts Bay on July 15-21, 2001.

Kristina Katsaros attended the NASA-sponsored Water Cycles Workshop in College Park, Maryland on July 16, 2001. She then attended the Senior Research Council Meeting in Muskegon, Michigan on July 18-19, 2001.

Chunzai Wang collaborated with oceanographers on a climate study concerning the roles of the western Pacific and eastern China Sea in relationship to the El Niño-Southern Oscillation phenomenon in Peking, China on July 20-August 4, 2001.

Michael Black and Judy Gray attended the National Weather Service Employee Organization's contract negotiations in Washington, D.C. on July 23-27, 2001.

Michael Farmer attended the Laboratory Safety and Environmental Management Conference in Alexandria, Virginia on July 23-27, 2001.

Christopher Landsea made a presentation at the Congressional Natural Hazards Caucus Meeting on Hurricanes in Washington, D.C. on July 25-26, 2001.

Howard Friedman attended a NOAA Equal Employment Opportunity Council Subcommittee on Underrepresentation meeting in Silver Spring, Maryland on July 26-27, 2001.

Alejandra Lorenzo attended the OAR Webshop 2001 meeting in Boulder, Colorado on July 31-August 2, 2001.

Robert Molinari attended a Global Ocean Observing System (GOOS) Steering Committee Meeting in Seattle, Washington on July 31-August 4, 2001.

Jia-Zhong Zhang and Tsung-Hung Peng will attend the Gordon Research Conference on Chemical Oceanography in Tilton, New Hampshire on August 12-17, 2001.

John Proni will attend the 17th International Congress on Acoustics in Paris, France on August 24-13 September 2001.

AOML Scientists Support Project INSTAR

Fifty Miami-Dade County science teachers went back to school this past June 18-27, 2001 to participate in Project INSTAR (Investigating Nature through Science Teacher Active Research). The intensive, eight-day teacher development course, taught by scientists from the University of Miami's Rosenstiel School and AOML, engaged its "students" in a series of laboratory, field, and technology training sessions geared towards enhancing their knowledge and understanding of marine and atmospheric science.

New to the Project INSTAR curriculum for 2001 was the addition of a tropical meteorology theme, co-developed by Shirley Murillo, a meteorologist with AOML's Hurricane Research Division (HRD), and AOML oceanographer Evan Forde. The greatest challenge in developing the curriculum, according to Murillo and Forde, was condensing the material into eight very concentrated days of instruction. "We required the teachers to do quite a bit of reading and studying each night," stated lead instructor Murillo.

Aside from basic meteorological principles, INSTAR students were introduced to the dynamics of tropical weather systems,

the role of the tropics in general atmospheric circulation, and the impact of weather upon coastal communities. Guest lectures presented by several HRD meteorologists capitalized upon the wealth of expertise at AOML. Students also participated in satellite weather imaging, computer hurricane modeling, and weather forecast training sessions. Field trips included visits to the National Hurricane Center, the Miami National Weather Service office, and a two-hour session with Roland Stedham, a local NBC television station meteorologist. In November 2001, INSTAR students must make formal presentations of their lesson plans. Upon successful completion of course requirements, they will receive three graduate-level credits from the University of Miami.

In addition to their involvement in Project INSTAR, Murillo and Forde are regular participants in numerous community outreach and educational activities. Murillo, the first female Hispanic meteorologist with the Hurricane Research Division, has represented NOAA at a variety of science and job-related fairs in the south Florida area. She currently serves as a member of the American Meteorological Society's (AMS) Board on Women and Minorities and is actively involved with the AMS' minority recruitment program. Forde, a long time NOAA/AOML employee and one of only a handful of African-American oceanographers in the country, has volunteered thousands of hours to public education activities and has spoken to nearly 18,000 school children during his outreach presentations. He has worked as an INSTAR volunteer since 1998.

As native Miamians and products of the Miami-Dade County public school system, Murillo and Forde are enthusiastic in their efforts to promote interest and appreciation for NOAA research and science education in the south Florida community. Through Project INSTAR, teachers become better prepared to convey the basic concepts of science to their students and, ultimately, inspire them to greater learning.



INSTAR instructors Shirley Murillo and Evan Forde (center) surrounded by their tropical meteorology students.

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